

ENERGY AND THE SINO-RUSSIAN RELATIONSHIP

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A robust Sino-Russian energy relationship could be exceedingly valuable for each of the two states. China's energy policy is linked to its security policy and Beijing is determined to ensure that China has access to vital sources of energy well into the future. Russia is dependent on the revenues from its energy sector and Moscow is interested in increasing energy exports to Asia. On the surface it seems that a mutually beneficial energy partnership between China and Russia is inevitable, but Sino-Russian relations are fraught with challenges which impact their cooperation in the energy sector. This paper provides an overview of the world energy market and the Chinese and Russian energy industries, identifies areas of energy-related cooperation and conflict between China and Russia, and discusses the implications of Sino-Russian energy ties for the United States.

Sino-Russian energy links illustrate both the promise and limitations of the broader partnership. The Russian and Chinese governments trumpet their strategic relationship. Political ties are excellent, and by all accounts President Putin and President Xi are personally close. Both sides call for deeper economic relations, and energy ties are a major priority. China and Russia have complementary economies, with Russia being a major energy exporter and China needing to import oil and natural gas. Indeed, in May 2015 Russia became the largest supplier of oil to China for the month, passing Saudi Arabia and Angola. However, the energy relationship has also been marked by frustrations. In spite of years of negotiations, gas pipelines have not been built to bring natural gas from Russia to China. Moreover, China has not yet made significant upstream investments in the Russian energy industry.

This paper will begin with a brief description of the world energy environment, which is marked by abundant supplies and slowing demand. The paper then moves to an overview of the Russian and Chinese energy industries. The Russian energy sector is dominated by the state, and the Russian economy is heavily dependent on oil and gas revenues. While Europe is still Russia's primary energy market, Russia is looking to diversify its customer base. The Chinese energy sector is also dominated by the state. While China's growth in energy demand is slowing, China still is faced with a long-term challenge of energy security, as well as an urgent need to clean up its environment. The final section of

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the paper examines the current state of Sino-Russian energy ties, demonstrating both successes and frustrations. Low oil and gas prices, combined with China's economic difficulties, make new Chinese expenditures on Russian energy projects unlikely in the short to medium term. However, if western sanctions over Ukraine continue against Russia in the long term, Russia will likely be forced into greater compromises with China that will strengthen China's position in the Russian energy sector and reduce Russian flexibility.

THE WORLD ENERGY MARKET

Four major factors have influenced the world energy market starting in 2014. First is the growth of global energy supplies, due largely to increases in US production. BP reports:

The most significant development on the supply side in 2014 was undoubtedly the continuing revolution in US shale. The US recorded the largest increase in oil production in the world, becoming the first country ever to increase average annual production by at least 1 million barrels per day for three consecutive years. The US replaced Saudi Arabia as the world's largest oil producer—a prospect unthinkable a decade ago. The growth in US shale gas in recent years has been just as startling, with the US overtaking Russia as the world's largest producer of oil and gas.¹

The ending of many sanctions on Iran in 2016 and ramped up Iranian oil exports further contribute to the oil surplus.

The second major factor is slowed worldwide demand. In 2014 global primary energy consumption grew by only 0.9 percent, less than half the ten year average of 2.1 percent. Moreover, renewables made up one-third of the increase in energy use, further squeezing the markets for oil, coal and gas. As a result of rising supply and slowing demand, oil prices dropped from \$110/barrel in June 2014 to less than \$30/barrel in January 2016. The third factor is the geographic shift in energy demand. All of the net growth in energy consumption in 2014 came from emerging economies, a long-term trend. For the fourteenth year in a row, China recorded the largest growth in energy demand. (In 2013, China became the world's largest net oil importer.) Organization for Economic Co-operation and Development energy consumption fell by 0.9 percent, with the European Union dropping 3.9 percent and Japan dropping 3.0 percent. In fact natural gas consumption in the EU dropped a record breaking 11.6 percent.² A fourth factor that will continue to affect energy markets is a new worldwide commitment to slow the effect of climate change, as demonstrated by the 2015 Paris Agreement. Even developing states that have traditionally put strong emphasis on maintaining sovereignty in order to push for maximum economic growth, such as China and India, are facing domestic as well as international pressure to reduce carbon outputs and are taking stronger steps to reduce environmental damage.

Another feature of world energy markets is that gas prices, at least in Asia, are less flexible and market-driven than oil prices. Oil is bought and sold on a worldwide market, and prices are mainly driven

by market conditions. Gas, on the other hand, is often priced according to long-term contracts that are not necessarily transparent. Pipelines in particular are expensive and require long-term commitments in order to recoup costs. Moreover, Asian gas customers are separated from each other by geographic barriers, preventing an integrated Asian gas market. Liquid natural gas (LNG) is bringing changes to some degree. However, Asia still lacks transparent trading hubs without heavy government regulation that would foster greater market-driven pricing.³ As a result, Asian consumers frequently pay higher rates for gas than customers in Europe or the United States.

THE RUSSIAN ENERGY SECTOR

Russia is an energy exporting state. Its economy depends on the price of oil and gas and the volume of its exports of these commodities. However, Russia has struggled in putting together an efficient energy industry that does not rely on international expertise and financing. Russian energy policy is also caught up in Russian efforts to use the energy card to enhance its status as a great power.

There are several facets of the Russian energy industry that are important to understand.⁴ First, Putin has succeeded in centralizing the energy industry under state control. This was classically illustrated in 2003 when Mikhail Khodorkovsky, owner of the oil firm Yukos, was arrested and the Russian state dismantled his company. Putin saw Khodorkovsky as a political challenger. Khodorkovsky used his influence to keep taxes on oil low, made enemies of the state-owned firm Transneft, and in making plans for a pipeline to China ignored the Kremlin's objections that he was conducting foreign policy. The Kremlin believed the pipeline would make Russia too dependent on China. Furthermore, his plan to sell stakes in Yukos to ExxonMobil was seen as a betrayal of Russia and the Russian state. Within four years of his arrest, the percentage of oil produced by private firms in Russia dropped from 90 percent to 45 percent.⁵

Today the major state-owned oil firms control approximately 50 percent of oil production. These include Rosneft, Gazprom Neft, and Slavneft. State-owned Transneft dominates oil pipelines. In the gas sector, Gazprom produces 74 percent of Russian gas, and has a legal monopoly on Russian gas exports. The only exception is LNG. However, state domination of the industry does not imply a unitary actor directing energy policy. There is a great deal of factionalism and politics in the Russian energy industry. For example, a 2013 law enabled companies other than Gazprom to export LNG, which favored Novatek and Rosneft. In addition, the delays in building oil pipelines to China and the Pacific were caused in large part by factional infighting in Russia related to contracts and the location of the pipelines. Ben Judah claims the Eastern Siberia-Pacific Ocean pipeline was plagued by delays and \$4 billion in construction fraud.⁶

The Russian state is highly dependent on the energy sector for both GNP and tax revenues. In 2010, oil and gas comprised 63.5 percent of Russian exports and 17.3 percent of GDP. The prominent role of energy exports raised the value of the ruble and made Russian exports in other areas less competitive. By 2015 it was reported that natural resources account for 19 percent of Russian GNP, while approximately 50 percent of Russian government revenue came from the energy sector.⁷ These figures vary over time, of course, with the price of oil and gas.

In 2008, 68 percent of Russian oil production came from West Siberia, 29 percent from European Russia, but only 3 percent from East Siberia and the Far East. However, growing production in the east necessitated new Asian markets that were closer to oil supplies. The three main production bases in the east are the Irkutsk region, Sakha Republic, and the Krasnoyarsk region. Similarly, Russia has gas fields in the east and west. West Siberia, with a well-developed infrastructure, accounted for 93 percent of Russian gas production in 2008. East Siberia/the Russian Far East needs further development. It supplied only 2.2 percent of gas production in 2008. The three main gas supply centers in the East are Kovyktinskoye (or Kovykta) gas, Sakhalin offshore gas, and Sakha Republic gas.⁸ In addition to producing and transporting its own gas, Russia plays an important role in transiting the gas of other post-Soviet states.

The primary market for Russian gas and oil is still Europe, with 80 percent of crude oil exports and 75 percent of gas exports flowing there.⁹ Moreover, Europeans pay a higher price for gas than China seems willing to pay. However, Russia's goal is to increase the share of energy exports to Asia. Paik reports:

According to the Draft Russian Energy Strategy to 2035 (prepared and released by the country's Ministry of Energy in January 2014) the share represented by the Asia-Pacific region in Russian exports of oil and refined products by 2035 will increase from 12 per cent to 23 per cent (32 per cent for crude oil) and from 6 per cent to 31 per cent for gas. To achieve this target, capital expenditure in the energy sector is set to increase gradually to US\$793 bn between 2031 and 2035 from US\$460 bn between 2011 and 2015.¹⁰

However, western sanctions are taking a heavy toll on the Russian energy industry. Without western managerial and technical expertise, as well as financing, it is unclear if Russia can make the necessary investments to fully develop its eastern resources, to say nothing of the Arctic.

In sum, since 2000 Russian oil and gas exports have increased significantly. However, Russia now faces the challenge of western sanctions at the same time that energy prices have plummeted, demand is down, and there is growing competition from new producers. Moreover, Russia has underinvested in its energy infrastructure while massive amounts of capital are needed to develop eastern resources. As a result, the ability of the state to use energy as a power resource in Russian diplomacy has been reduced. For energy producers such as Russia, energy security means security of demand and stable markets. Russia currently lacks energy security. Therefore, new energy sales to China are imperative.

THE CHINESE ENERGY SECTOR

China's rapid industrialization quickly thrust it from being a state that was self-sufficient in energy to one that needed to import increasing amounts of oil, gas, and even coal. Thus the Chinese government's primary energy policy concern has been energy security, meaning security of supply. In addition, environmental concerns are leading China to seek to replace the use of coal with cleaner forms of energy.

Like Russia but to an even greater extent, China's energy industry is dominated by state-owned corporations. The China National Petroleum Corporation (CNPC), whose listed arm is PetroChina, and the China Petroleum and Chemical Corporation (Sinopec) dominate onshore oil and gas, while the China National Offshore Oil Corporation (CNOOC) has a monopoly on offshore resources. These three companies together control 95 percent of China's oil and gas output and 70 percent of refining capacity, with CNPC producing approximately 77 percent of China's natural gas.¹¹

Overseeing these firms is a complicated government bureaucracy. Major players include the National Development and Reform Commission (NDRC), the state planning agency, which is a department of China's State Council; the Ministry of Commerce (MOFCOM); and the Ministry of Land and Resources. The NDRC regulates the price of natural gas and oil products and is the main body for planning, policymaking, and regulating the energy industry. MOFCOM oversees energy imports and the domestic oil market, while the Ministry of Land and Resources oversees energy exploration. The Ministry of Foreign Affairs, Ministry of Finance, the State Oceanic Administration, and the Ministry of Environmental Protection also play a role.

The Chinese leadership has frequently reshuffled the energy bureaucracy. For example, in 2003 the Energy Bureau was created under the NDRC. In 2005 the Energy Leading Group was established under Premier Wen Jiabao, as was a State Council Energy Office that reported to the premier as well. In 2008 the National Energy Administration was set up under the NDRC. Its function is to administer the energy sector, approve new energy projects, and set wholesale energy prices. In January 2010, a National Energy Commission headed by Premier Wen was established to consolidate energy policies.¹²

One question that arises out of this structure is how coordinated China's energy policy is. Jean Garrison asserts that China's "decentralized policymaking process has led to a fragmented energy policy," while Michal Meidan argues that China's energy policy is shaped by "politically powerful energy conglomerates operating in a fragmented bureaucratic framework."¹³ Zhao Hongtu from the China Institutes of Contemporary International Relations (CICIR), a think tank affiliated with the Ministry of

State Security, makes the case that China's state owned enterprises are driven largely by the profit motive rather than state goals such as energy security. Such firms are largely autonomous and may even have conflicting interests with the Chinese government.¹⁴ On the contrary, Øystein Tunsjø argues that in spite of the views of fragmentation, Beijing does have control over the national oil companies (NOCs) through the appointment of leaders, the power of the NDRC, price controls and tax rates, leverage over bank credits, and the formation of government strategy.¹⁵ However, it appears that on balance, the disjointedness of the Chinese bureaucracy and the power of the NOCs makes it likely that while Beijing may direct the energy sector in a broad sense and can intervene in specific cases when necessary, energy companies still enjoy a fair amount of autonomy.

In fact, there is evidence that Xi Jinping believes that energy companies are too autonomous. Since he took office, President Xi has overseen a concerted anticorruption campaign, with the coal and oil industries being special targets. For example, in March 2015 Liao Yongyuan, the vice chairman of CNPC, was placed under investigation by the Central Commission for Discipline Inspection. Subsequently he was expelled from the Party and prosecuted for bribery. While the energy industry may indeed have a great deal of corruption, it is equally likely that the sector is being targeted for political reasons. Zhou Yongkang, China's former security chief and member of the Politburo Standing Committee, was expelled from the Party and convicted of corruption in 2015. He had spent over 30 years in the oil industry and had been the party secretary of CNPC before moving on to higher positions. Thus President Xi in all likelihood sees the oil sector as the power base of a former political rival, and a sector that is too independent.¹⁶

China has strong domestic energy production, although it cannot keep pace with China's growing demand. China's primary source of energy is coal, which accounts for about 70 percent of China's energy use. In fact, China uses almost as much coal as the rest of the world combined. However, the state has set a goal of moving away from coal consumption due to China's serious pollution problems, as laid out in the 2014-2020 Energy Development Strategy Action Plan. The government intends to cap coal consumption by 2020, and China has pledged to the international community to reduce its carbon intensity. With coal use being discouraged, China will work to replace it with gas as an energy source. China also plans to raise the share of non-fossil fuels in the total energy mix from 9.8 percent in 2013 to 15 percent by 2020.¹⁷

China's most productive oil fields are mature, leading China to utilize enhanced oil recovery techniques to maintain oil production at older fields and strive to find new sources of oil. Daqing in Dongbei (China's northeast region) remains the most important oil field, producing 19 percent of China's crude in 2014. The Shengli oil field near the Bohai Bay was China's second largest oil producer, while Changqing in the north central Ordos Basin is the third most productive field. Xinjiang province in

China's far northwest also has significant oil fields. Furthermore, twenty percent of China's domestic oil comes from offshore sources. China's main gas production bases are the Tarim Basin, Ordos Basin, Sichuan Basin, and offshore locations. The country has a network of domestic oil and gas pipelines to distribute energy across the country.¹⁸

China's energy demands have expanded at a breathtaking rate. In 1980, China used 6 percent of total global energy. In 2013 it used 25 percent.¹⁹ From 1980-2000, Chinese energy consumption grew at an annual rate of 4.2 percent. From 2000-2005, energy use growth averaged 9.9 percent a year. Thus China's energy demand doubled from 2000-2010.²⁰ In 1993 China became a net importer of oil, while in 2007 China became a net gas importer for the first time. In 2014 China imported more oil than it produced domestically, with an oil import dependence of approximately 57 percent. Although China more than tripled natural gas production from 2003-2013, in 2013 China had to meet about one-third of its natural gas demand via imported pipeline gas from Central Asia and imported LNG. The government's goal is to raise the share of natural gas in total energy consumption to at least 10 percent by 2020.²¹

Industry consumes a disproportionate share of China's energy. In 2011, industry accounted for 72 percent of Chinese energy consumption, compared to 53 percent in Russia, 44 percent in Japan, and 34 percent in the United States.²² Moreover, China's development model has been very energy intensive, and price controls on energy have exacerbated inefficiencies. However, as the Chinese rate of economic growth slows to a "new normal" and the country seeks to shift to a growth model based more on consumption, the rate of growth in energy consumption will decrease. Moreover, the proportion of energy used by industry will decrease and that used by consumers will rise.

China imports oil from a wide range of suppliers and regions in order to enhance its energy security and prevent itself from becoming too dependent on a single source. In 2014, China's top suppliers were Saudi Arabia (16 percent), Angola (13 percent), Russia (11 percent), Oman (10 percent), Iraq (9 percent), and Iran (9 percent). Other suppliers included Venezuela, UAE, Kuwait, Colombia, Congo, Brazil, South Sudan, and Kazakhstan (all under 5 percent each).²³ Half of China's crude oil comes from the Middle East, with China importing more than 3 million b/d (barrels per day) from the region, and it is projected that by 2035 China's imports from the Middle East will double.²⁴ However, in 2014 Russia's oil exports to China increased 36 percent, and in May 2015 Russia became China's top oil supplier for the month, the first month that Russia was China's top crude supplier since October 2005.²⁵ For the first ten months of 2015, China imported 15 percent of its oil from Saudi Arabia, and 12 percent each from Russia and Angola.²⁶

In 2014 China imported 58.3 bcm (billion cubic meters) of gas. Of this total, 31.3 bcm (54 percent) came via pipeline, primarily from Central Asia, while 27 bcm (46 percent) was LNG. LNG

comes from a wide variety of countries, including a small amount from Russia. In fact, CNOOC has been rapidly increasing China's LNG imports, and new LNG-receiving terminals are being built throughout China.²⁷

There have been many challenges for China in shifting from energy independence to being a major importer over a relatively short period of time. These include the difficulty of energy diplomacy, the near impossibility in sustaining its long-standing policy of non-interference in places like Sudan, and complete lack of control over oil prices in a global market.²⁸ However, the biggest dilemma for Beijing has been energy security. For China, energy security means reliable access to the oil and gas it needs at a reasonable price. While both adequate supply and price are important, supply is primary. Moreover, China thinks of energy policy and security policy as linked in a broader grand strategy. Sea power, commercial interests, energy, and other factors are incorporated into the broader security picture.²⁹

China is dependent for obtaining oil imports on a complicated and well developed global energy system that existed long before China began gas and oil imports. On the one hand, oil is traded according to a liberal market system, a system where prices adjust in accord with supply and demand and where oil usually is available for countries that can pay the market price. It is also a system in which western companies have invested in those oil and gas fields that are most productive and located in the most stable (in relative terms) countries. This has made investing in overseas gas and oil fields more challenging for China. Moreover, there is also a strong military component in protecting energy sources. The United States has been the lead actor in this, and its actions, sometimes taken unilaterally, affect the entire world market. The United States also has the most powerful military in the global commons. The US Navy has kept sea lanes open for the shipment of oil, but could also presumably close them down as well.

Øystein Tunsjø argues that China's approach to energy security is one of hedging. Hedging incorporates both the government's main concern of energy supply and the NOCs' priority of earning profits. While NOCs pursue profits, the government intervenes to ensure state interests are upheld when necessary. Hedging combines market approaches with strategic approaches to safeguard China's access to oil and gas.³⁰ China takes six steps to ensure energy security: attempting to reduce reliance on imports, diversifying supply sources, investing abroad, protecting sea lanes, diversifying delivery sources, and building reserves.

First, the Chinese government has set a goal of limiting oil import dependency to 61 percent. However, it is unlikely China will meet this goal. The International Energy Agency predicts that China's oil dependence ratio will be 80 percent in 2030.³¹ China would need to take drastic steps to prevent dependency from exceeding 61 percent. However, as we have seen, China has been successful in its second strategy of importing oil and gas from a wide range of sources.

Closely related to diversifying supply is China's third strategy of encouraging NOCs to invest abroad to acquire equity stakes in oil and gas fields, as well as refineries. In 2002 China's "going out" strategy of encouraging energy companies to invest abroad accelerated. Keun-Wook Paik states that in initiating this policy, China believed "it could maximize its benefits by coordinating the activities of the government, oil companies, diplomatic channels, and the trading sector."³² This gave China's NOCs great influence. It also led to investments in politically unstable environments, such as what is now South Sudan, where other oil companies were unwilling to go. Unlike what is sometimes assumed, most of the energy extracted by Chinese firms abroad is sold on the international market rather than transported to China.

The US Energy Information Administration estimates that China invested \$73 billion in overseas oil and gas assets from 2011-2013. In 2013, these assets produced about 2.1 million bbl/d (barrels per day) of oil. China has invested heavily in Iraq, Kazakhstan, Sudan, and South Sudan. It has also invested in deep-water oil on the west coast of Africa, offshore oil on the coast of Brazil, natural gas in Australia, and oil sands and shale gas in North America. In addition, China has made oil or gas for loan deals with Russia, Kazakhstan, Venezuela, Brazil, Ecuador, Bolivia, Angola, Ghana, and Turkmenistan. However, this has been a learning process for Chinese companies; one estimate suggests that in 2010 two-thirds of oil investments abroad were losing money.³³

The fourth energy security strategy is protecting sea lanes. Regional states throughout Asia have exhibited growing resource nationalism by expanding their naval forces, flagging oil tankers, and engaging in more intensive surveillance, in part to defend energy imports from perceived threats to sea lines of communication.³⁴ China is no exception. Tu *et al* note that 80 percent of China's oil imports flow through the Straits of Malacca. US naval forces, and the forces of US allies, have the capability to threaten China's sea lanes and block strategic chokepoints.³⁵ As a result, one of the "New Historic Missions" of the People's Liberation Army has been to expand naval forces and operational capabilities to protect China's sea lanes.

The fifth strategy is to diversify the means of energy delivery. This means building pipelines to supplement seaborne energy shipments. China is connected by oil or gas pipelines with Kazakhstan, Turkmenistan, Russia, Uzbekistan, and Myanmar. Pipelines are expensive and cannot substitute for oil shipments by sea. They also tend to be tied to long-term contracts and are inflexible once built. However, a pipeline strategy hedges against threats to seaborne trade. Seaborne energy trade is safer in peace, as pipelines are long and potentially vulnerable to terrorist attacks. However, pipelines are safer during war.³⁶ The final hedging strategy of China is building up strategic petroleum reserves. By the middle of 2015 China had approximately 200 million barrels of crude reserves, with a goal of eventually storing 500 million barrels. In the first seven months of 2015, China purchased approximately half a

million barrels of crude more than it needed in order to build reserves, taking advantage of low oil prices.³⁷

Russia is a crucial player in most of these strategies. Russian oil, and perhaps someday gas, contributes to the diversity of supply. China hopes to invest in the Russian oil industry, although Russia has been slow to approve of such investments. China hopes to work with Russia as a strategic partner to protect sea lines of communication, and oil flows to China via pipelines originating in Russia. Moreover, greater energy supplies from Russia would somewhat limit dependence on the often-violent Middle East and reduce the need for seaborne energy shipments. In the next section we turn to the Sino-Russian energy relationship.

RUSSIAN-CHINESE ENERGY COOPERATION AND CONFLICT

There is compelling economic logic to a robust Sino-Russian energy relationship. Back in 2000, a Chinese analyst argued that several factors were driving Russian-Chinese energy cooperation, including a post-Cold War environment of reduced tensions in Northeast Asia, Russia's surplus of energy and China's increasing demand (including the need for cleaner gas), Russia's need for greater revenue, and the enhancement of China's energy security. In 2014, these same arguments were being made in China, with the additional factor that Sino-Russian trust had deepened over the ensuing years.³⁸ Moreover, both sides claim a strategic relationship. More closely cementing energy ties, particularly with gas pipelines, would give stronger evidence of a truly strategic relationship. While there has been cooperation, or at least negotiations over cooperation, in the realms of coal, electricity, gas, renewables, and nuclear energy, the greatest progress by far has been in oil.

In April 1996 Russia and China signed the Agreement on Energy Cooperation between the People's Republic of China and the Russian Federation. This was the first intergovernmental agreement between Russia and China on working together in the energy sector, and established a joint commission, subcommittees, and regular meetings at the prime minister level. However, little was achieved in the 1990s beside agreement on feasibility studies for developing oil and gas pipelines, in part because the potential of energy reserves in eastern Siberia was uncertain.

In the early 2000s, CNPC was negotiating with Yukos to build a pipeline connecting Angarsk in Russia to Daqing in China's northeast. CNPC fully expected these negotiations to be successful and began increasing refining capacity, refurbishing pipelines, and building new storage capacity in Dongbei to accommodate the new flow of oil. However, in 2002 the Russian firm Transneft put forth a competing proposal, reportedly endorsed by President Putin, for a pipeline running from Angarsk to Nakhodka on the Russian Pacific coast. The pipeline would be longer and more expensive, but would enable Russia to sell oil to the United States, Australia, and all of Asia, not just China. Japan gave support for a pipeline to

the coast, adding to the project's attractiveness. This also created a rivalry between China and Japan over Russian oil.³⁹ Russian officials gave competing statements on which route they favored, and China became frustrated and started looking to Central Asia in 2003. The arrest of Mihail Khodorkovsky and Moscow's dismantling of Yukos in 2003 eliminated the prospects for imminent construction of the pipeline to Daqing.

Russia continued to delay in making a decision on a pipeline route. However, on December 31, 2004, Russian Prime Minister Mikhail Fradkov signed a directive that gave approval for the East Siberia-Pacific Ocean (ESPO) pipeline system, terminating on the Pacific coast. Construction began in 2006 with Transneft leading the project, but there were routing changes due to concerns over the environment around Lake Baikal, as well as construction delays. During pipeline construction, Russia supplied oil to China via rail, but the Chinese were frustrated over the lengthy process and the difficulties in dealing with the Russians. There was a great deal of jockeying between oil companies in Russia and between the oil companies and government, making it difficult for China to engage in effective negotiations.

In 2008 the Sino-Russian Energy Negotiation Mechanism was established, better institutionalizing energy cooperation. In 2009, CNPC and the China Development Bank signed an agreement with Rosneft and Transneft, providing the Russian companies \$25 billion in loans (\$15 billion to Rosneft and \$10 billion to Transneft), with the Russian companies in turn guaranteeing crude oil supplies to China of 300 million tons over 30 years and a spur in the ESPO pipeline to China. These loans were vital for Russia to complete the work, especially as oil prices had substantially dropped from 2008 levels. Later that year, construction began on the spur to China. In December 2009, the 4,857 kilometer ESPO pipeline was completed to Russia's Pacific port of Kozmino, near Nakhodka. The pipeline and port cost a reported \$14 billion. This was a major advance for the Russian oil industry, in that it provided diversification away from Europe to markets in Asia. The next year, 2010, the spur to China (64 kilometers to the Chinese border) was completed and became operational in 2011. CNPC built the pipeline bringing oil from the border to Daqing. The price of oil was set based on spot markets.⁴⁰

Somewhat surprisingly, within the first two months of operations there was a price dispute between China and Russia. China cut payments to Rosneft and Transneft due to a disagreement over pipeline fees. The Russians charged CNPC with underpaying for oil by \$100 million and threatened to take the case to court in London. There were also disputes over volume. China wanted more oil shipped through the spur, but Russia could get higher prices by shipping oil to Kozmino and selling to other customers. The price dispute was settled in 2012.⁴¹

Currently China and Russia have agreements by which Russia will provide China up to 800,000 bbl/d of crude. In March 2013 Rosneft agreed to increase oil deliveries to China, and Russia agreed to allocate maximum volumes of crude to China over the ESPO pipeline, even if that reduces supplies to the

Pacific coast. Rosneft also made a deal with SINOPEC to provide 10 mt/y (million tons per year) of oil for ten years starting in 2014 (which is in addition to its contracts with CNPC). Russia sends oil to China by ship, rail, and pipeline, although most goes by pipeline. In fact, Russia uses a swap deal with Kazakhstan to help meet its contracts with China through a pipeline running from Kazakhstan to China. The ESPO pipeline spur to China provides up to 300,000 bbl/d of oil to China. Russia projects that it will double the capacity of the spur to China by 2018, as well as increase overall ESPO capacity by 2020.⁴² For the first ten months of 2015, Russia was China's second largest supplier of oil.

Building pipelines to export gas from Russia to China has followed an even more tortured path. In 1994 China and Russia signed the first MOU on building a natural gas pipeline to China. From 2000-2005 there were discussions of a gas pipeline from Koyukta that would supply China and South Korea. However, the project never reached fruition, largely due to energy politics within Russia and efforts by Moscow to give Gazprom control over all gas in the Asian part of Russia. In 2005, Gazprom indicated that it hoped to build two pipelines to China and begin supplying gas by 2010. However, in the meantime, China, impatient with the slowness of negotiations with Russia, began constructing pipelines to import gas from Central Asia. In the March 2006 summit between President Putin and President Hu, Gazprom and CNPC signed a memorandum on natural gas supplies and the construction of two pipelines, with gas reaching China beginning in 2011. However, lack of action and an inability to agree on price again undermined the deal. A further summit between Prime Minister Putin and Premier Wen in 2009 failed to resolve outstanding issues. In 2010 Gazprom announced it had reached a deal on gas delivery with CNPC, with deliveries to begin in 2015. However, again the two sides failed to reach agreement on price and the deal fell through. Negotiations resumed in 2012 on a western gas pipeline.

The price issue was fundamental. China initially wanted the gas price based on a coal-based benchmark, which Russia rejected, so CNPC became more flexible. Russia wanted China to pay gas rates similar to those paid by Europeans. CNPC argued that Chinese consumers could not afford this rate, especially as the long pipeline transmission would further raise costs. The price issue for gas ultimately required a political solution, which proved unreachable. In addition, Russian refusal to allow Chinese companies equity stakes in its gas fields made the price issue even more difficult for China. Furthermore, China and Russia disagreed over the pipeline routes. China preferred an eastern route that would bring gas into Dongbei from eastern Siberia, while Russia preferred a route from western Siberia. A 2011 summit between President Medvedev and President Hu again failed to resolve the impasse, although in a 2013 summit Russia agreed to prioritize the eastern gas route.⁴³

A breakthrough seemingly occurred in 2014. On May 21 the legally binding "Power of Siberia" contract was signed between PetroChina and Gazprom, a \$400 billion deal that would deliver 38 bcm/y of pipeline gas from eastern Siberia to China's northeast over 30 years. This is equivalent to 16 percent of

Gazprom's current exports. Gazprom estimated that eastern route development will cost \$55 billion, which includes exploiting the Chayandinskoye and Kovyktinskoye gas fields, while CNPC is expected to pay \$22 billion for pipelines and infrastructure. The border points for the pipeline are Blagoveshchensk in Russia and Heihe in China. Gazprom began the Power of Siberia pipeline on September 1, 2014 at a ceremony attended by President Putin and Chinese Vice Premier Zhang Gaoli. At the time the contract was signed, the two sides expected that gas deliveries would begin in 2018. The details on the border price of the gas were not announced, although some analysts believe it is not too different from what Germany pays and may be linked to a basket of crude and oil products in Singapore. Some analysts expected that China might use upfront payments as a way to reduce the border price, although whether it will do so is still unclear.

On November 9, six months later, a memorandum of understanding (MOU) was signed on a project that would deliver 30 bcm/y of western Siberian, or Altai gas, to China for 30 years. However, the MOU is not legally binding and the next step would be for the two sides to complete negotiations leading to a binding contract. The Zapolyarnoye and Yuzhno-Russkoye fields are expected to supply the Altai pipeline if it is built.

Russia and China both had strong motivations to make a deal. China, as previously discussed, prefers diversity of energy sources and delivery to enhance its energy security. The Chinese government believes that the eastern route will help bring greater economic development to Dongbei, an area that lags behind the rest of the country.⁴⁴ Moreover, greater supplies of gas will help China meet its environmental goals by shifting away from coal. China is witnessing rapid growth in gas consumption, and the domestic price is rising. In addition, Russian gas will increase the overall supply of gas to Asia and thus likely reduce prices China and the rest of the region pay for LNG. From Russia's perspective, further growth in the energy industry is vital to revive its economy. Gazprom needed diversification away from Europe. However, sanctions over Ukraine served as the final catalyst, as Europe seeks to find gas from sources other than Russia. Asia is the only region where Russia can expand its gas exports, and a pipeline to China is the first step.⁴⁵

However, 2015 brought a sharp reversal in the optimism seen just the year before. Plunging energy prices and a major slowdown in industrial growth in China have significantly changed the pipeline environment. In February 2015, CNPC revised its forecast for Chinese gas demand in 2020. The estimate fell from 400 billion cubic meters to only 310 billion cubic meters. Moreover, it is expensive to change over industry from using oil or coal to gas, and China's economic slowdown makes this process less affordable. Moreover, the anticorruption campaign in China has caused Chinese energy companies to proceed more cautiously so as not to attract attention. On the Russian side, Gazprom's production fell sharply in the first half of 2015, and western sanctions are hurting the company. This limits Russia's

ability to finance new projects. Low gas prices made the return on expensive pipelines dubious and created new debate within Russia on the economic viability of pipelines. There are also debates between China and Russia on how to price gas, and more specifically on whether to maintain the longstanding linkage between gas and oil prices.

Russian media reports that the western Altai pipeline, or Power of Siberia 2, has been “delayed indefinitely.” This is problematic for Gazprom in that the gas fields in western Siberia are already developed, while those in the east require massive new investments. However, from China’s perspective, the western region of China is already served by Central Asian gas, so the Altai project has low priority. While the eastern Power of Siberia pipeline, which has always been China’s preference, may still go forward, China so far has not offered pre-payments that would make construction easier. The details of negotiations between Gazprom and CNPC are not public, but some have speculated that disagreements may revolve around pricing, equity stakes, or the use of Chinese contractors. Prospects are uncertain, especially in light of the financing required.⁴⁶ In short, Russia’s frequent delays and the inability to cut a deal with China on gas pipelines when gas was more expensive have hurt it.

As has been illustrated, there have been successes and failures in the Sino-Russian energy relationship. Russia wants to sell gas and oil to China at the highest price possible, and is displeased that energy dominates the economic relationship. Russia fears that exporting oil and gas to China enhances Chinese power, and further worries that greater economic cooperation with China could weaken its grip on the Russian Far East.⁴⁷ China has long felt frustration at the slow pace of progress in energy ties, both at the working level and leadership level. For example, in 2006, Zhang Guobao, vice director of the NDRC, publicly expressed exasperation at slow progress in energy cooperation projects, commenting on “Russian opinion changing like the weather forecaster, one day saying they have reached an agreement, the next saying there is no agreement at all.”⁴⁸ There was much political jockeying between Russian energy companies and government officials that the Chinese did not understand. China believed that at different times, Russia was playing it off against Japan and Europe. Even western sanctions on Russia, which pushed Russia toward China and gave China stronger bargaining power, have not been all positive from China’s perspective. Without western investments, know-how, and financing, it is much more difficult for Russia to produce oil and gas in eastern Siberia for the Chinese market.

China’s frustrations are illustrated in articles by Chinese scholars. Hao Yubiao and Tian Chunsheng suggest that the China threat theory in Russia, fears of being a resource vassal, the growing economic gap between Russia and China, and differences in values all inhibit energy cooperation, although they assert that the relationship had momentum in 2014.⁴⁹ Shi Ze, Director of the Center for International Energy Strategy at the China Institute of International Relations, has a long list of recommendations to improve the energy relationship, signifying serious problems. For example, he calls

for the two sides to work harder to reach consensus on problems that have slowed cooperation. He advocates stronger coordination on policies toward Central Asia, upstream and downstream investments, and pricing issues. He also calls for the implementation of existing agreements, the development of a strategic plan for energy cooperation, and improved working mechanisms.⁵⁰ In sum, the challenges in energy relations have not made China and Russia look like strategic partners, indicating a relationship that struggles with dividing benefits in a realm of seemingly natural cooperation.

One area of contention that may be changing is opportunities for Chinese firms to make upstream investments in the Russian energy industry. In 2002, CNPC attempted to purchase a controlling share of Slavneft in an auction. The Russian Duma passed a bill forbidding it, and reportedly a CNPC official was kidnapped in Russia and held until CNPC dropped out of the bidding process. In 2002-2003, CNOC was stymied in purchasing a controlling stake in the small oil company Stimul. China then realized its only real options for strategic partnerships were with Rosneft for oil and Gazprom for gas. In 2006 SINOPEC was able to purchase the Russian oil firm Udmurtneft, but only in a minority capacity with Rosneft. Also in 2006, Rosneft and CNPC created a joint venture, Vostok Energy, that won some auctions. There is also a joint venture between Rosneft and CNPC, the Chinese-Russian Eastern Petrochemical Company, for oil refining and gas stations in China.⁵¹ In sum, China has sought to make meaningful investments in the Russian energy industry, but has been slowed by Russian policies.

However, western sanctions on Russia and a struggling Russian economy have changed the political context to some degree. In February 2015 Russian Deputy Prime Minister Arkady Dvorkovich said that Russia had overcome a “psychological barrier” and may allow Chinese investors over 50 percent stakes in oil and gas fields.⁵² In November 2014 CNPC agreed to a 10 percent equity stake in Rosneft’s Vankor oil field, and reportedly seeks a 19.5 percent equity stake in Rosneft itself. However, the Vankor deal has not yet been completed, and an Indian firm, ONGC, has also agreed to purchase a stake in Vankor. In September 2015, China’s state-run Silk Road Fund announced it would take a 9.9 percent stake in Novatek’s \$27 billion Yamal LNG project. Russia has also invested in a Tianjin refinery. Thus, the tide may be shifting in equity investments. However, no large-scale deals have been announced yet, or deals in which a Chinese firm takes a majority stake. It is possible that like many optimistic pictures of the past, little will come of this.⁵³ Much depends on whether agreement can be reached on price, although there is still some political opposition in Russia to Chinese investments as well.

Another facet of the Sino-Russian energy relationship is Central Asia. China has invested in Central Asian energy fields, companies, and pipelines, in part due to the slowness with which energy ties with Russia have developed. In 1997 China began purchasing oil from Kazakhstan. It has purchased shares in various energy firms as well, such as a stake in Aktobemunaigaz in 1997 and additional stakes in 2004. In August 2005 CNPC bought PetroKazakhstan for \$4.18 billion, beating out the Russian firm

Lukoil, and in 2009 it took over MangistauMunaiGaz (MMG). China's involvement in Kazakhstan also includes pipeline construction. In 2005 the first phase of the China-Kazakhstan pipeline was completed in a joint venture between Kazakhstan's state-owned KazMunaiGaz (KMG) and CNPC. While each side had equal shares in the partnership, CNPC paid 85 percent of pipeline construction costs. In 2006 crude oil began to flow from Kazakhstan to Xinjiang. This was China's first international pipeline and extends 2,798 kilometers. While the relationship between Kazakhstan and China has been successful, Kazakhstan is careful to prevent too much equity investment by Chinese NOCs. Western energy firms play a major role in the country, and at one point, CNPC was forced to sell some assets.⁵⁴

China imports almost half of its gas from Turkmenistan, which has the world's fourth largest gas reserves. In 2006 a framework agreement was signed for building the 30 bcm/y Central Asia-China Gas Pipeline that would transit Uzbekistan and Kazakhstan. Pipeline construction began in 2008, and the first phase of the 1,818 kilometer pipeline became operational in 2009. Subsequently the capacity has expanded. CNPC has a service contract for the South Yolotan gas field, while the China Development Bank has loaned over \$8 billion to develop the field. This is the first Central Asian gas route to bypass Russia. It is also a crucial lifeline for Turkmenistan as an export route.⁵⁵

Chinese energy deals in Central Asia have arguably undermined Russian interests. Immediately after the fall of the Soviet Union, all Central Asian energy exports had to go through Russia. Paik notes "The development of crude oil pipelines between the two countries [China and Kazakhstan] was a painful blow to Russia, as it has led to a collapse of its monopoly position as the sole transit country and buyer of central Asian energy resources."⁵⁶ Similarly, Chinese purchases of Turkmenistan's gas gave it greater leverage over Gazprom in negotiating for Russian gas and inhibited Russian efforts to secure more of Turkmenistan's gas. China's purchases also give Central Asia bargaining power with Russia over pricing issues, although from Russia's perspective it is better for Central Asian energy to go to China than Europe, a more lucrative market.

Ziegler and Menon argue that China and Russia have adopted neomercantilist energy policies in Central Asia. They assert:

Neomercantilist energy policies in Central Asia reflect a zero-sum mentality. Each state seeks to maximize its power and influence unilaterally and through different multilateral organizations—Russia through the Collective Security Treaty Organization, Customs Union, and bilateral security treaties with Central Asian states, and China through the Shanghai Treaty Organization and bilateral trade and energy deals. In the absence of an effective international energy regime for Central Asia, the major powers jockey for advantage while the smaller energy-rich states seek to play the giants against each other.⁵⁷

While the Shanghai Treaty Organization would appear to be a natural organization through which to coordinate energy policies in Central Asia, and China has called for it to play such a role, Russia has not agreed.⁵⁸

From a political perspective, do Sino-Russian energy ties create a strategic relationship between China and Russia that binds their political interests more closely together and creates a quasi-alliance? The answer, at least for now, appears to be no. Øystein Tunsjø, as well as Jaffe, Medlock, and O'Sullivan in a National Bureau of Asian Research piece, argue that China's energy policies toward Russia are hedging strategies. China seeks oil and gas from a wide variety of sources, and Russia will not gain a disproportionate share of the Chinese market. Keun-Wook Paik is more cautious. He suggests that two key issues will determine if Sino-Russian energy cooperation will move to the strategic level: whether the Altai gas pipeline turns into a binding agreement and is built, and whether CNPC purchases a 20 percent equity stake in Rosneft.⁵⁹ So far neither of these has occurred, and even the eastern Power of Siberia pipeline is now delayed.

A comparison with Russian-European energy relations is also instructive. While Europe is much more dependent on Russian energy than China, these links did not prevent Europe from imposing tough sanctions on Russia over Ukraine. Moreover, Russia did not cut energy supplies in response to sanctions. Energy ties create mutual dependence. Since both buyers and sellers need each other, especially when sales are large, neither has particularly strong leverage. President Putin has tried to use energy as a geopolitical tool throughout his time in office, and has little to show for it in the case of China.

IMPLICATIONS FOR THE UNITED STATES

The implications of Sino-Russian energy ties for the United States are complex. On the positive side, the Obama administration has made slowing climate change a major priority. Convincing China to reduce its carbon footprint has been an important component of this effort. Environmental goals can be met by China limiting its use of coal and substituting it with Russian oil, and perhaps someday gas. Chinese oil imports from Russia also reduce China's imports from Iran. While most major energy sanctions against Iran have been lifted, the United States still has an interest in limiting Iranian oil sales.

The effects of Chinese-Russian cooperation on energy prices are more ambiguous and perhaps negative. Russia ships oil to China from eastern Siberia. In other words, new oil fields were developed to serve the Chinese market, raising the total supply of oil in the world. Similarly, if the Power of Siberia pipeline is built, it will be supplied by new gas fields in eastern Russia, raising the overall supply of gas and thus lowering the world market price. Economists used to believe that lower energy prices were good for the American economy. However, the recent plunge in energy prices has probably hurt US growth rates, especially as energy production in the United States has increased so much over the last decade and

energy firms are an important component of the US economy. Moreover, US natural gas producers had hoped that China would be a significant market for American LNG. However, gas supplies from Russia to China, if pipelines are built, would drop the price of natural gas for all of Asia, as well as provide a large supply to the Chinese market that would compete with US LNG. This would reduce the potential profitability and volume of US LNG exports.⁶⁰

On the negative side, Russian energy sales to China and Chinese investment in the Russian energy industry can impede the effectiveness of western sanctions on Russia. President Putin and other Russian leaders have hoped that the “pivot” to China would demonstrate to the West that Russia had other partners. However, due to low energy prices, continued Russian limits on upstream investments, Chinese pragmatism, and China’s own financial difficulties, China has not rushed in as Russia’s savior at this point.

Finally, serious steps to strengthen the Sino-Russian energy partnership could indeed move Russia and China to a true strategic partnership. The building of both pipelines agreed to in 2014 and large Chinese upstream investments in the Russian energy sector would be signs of a strategic partnership that was driven by more than commercial considerations. Such a strong relationship could harm US interests, as China and Russia have various strategic differences with the United States.⁶¹ However, so far Russia and China have taken only tentative steps in this direction. Energy cooperation has been slow from the perspective of those who see energy as a natural realm of cooperation. Neither side seems willing to give up commercial advantage for the sake of strategic ties. Russia, in particular, has slowed pipeline development. However, Putin’s annexation of Crimea and war in eastern Ukraine has put Russia in a very difficult strategic position. On the one side Russia faces western sanctions, on the other a rising China. In spite of western sanctions, Russia has so far decided it is too dangerous to throw in its lot completely with China. However, the longer western sanctions against Russia last, the more willing Russia will be to compromise with China in energy cooperation and broader economic development.

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